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THE INFLUENCE OF ECONOMIC CONSIDERATIONS IN THE FORMULATION OF NATIONAL STRATEGY

A lecture delivered
at the Naval War College
on 9 October 1953, by
Professor Edward Mason

Captain Mills and Gentlemen:

The subject which has been assigned me this morning is "The Influence of Economic Considerations in the Formulation of National Strategy." I want to take up under that general heading two main subjects: (1) What is the Relation of Economic Considerations to Military Capabilities, and (2) What is the Relation of Economic Considerations to the Use of Military Capabilities in Wartime?

So let me turn now to the first question: What is the Relation of Economic Considerations to Military Capabilities? In so far as military capabilities depend on quantities and qualities of materiel the most obvious economic indicators of military potential are the size of the national income and the size of various components of the national income. What an economist means by "national income" is simply the total volume of output of goods and services in a given year. Or, if you want to put it in monetary terms, it is the total quantities produced times the prices at which they sell. It is usually stated in value or price terms so you see estimates of the national income running in terms of billions of dollars of production in a given period.

If you look at these tests and compare U. S. military potential, in so far as it is governed by economic considerations, with Russian military potential the situation looks very rosy. Russian national income in so far as we know anything about it is certainly not more than one-third of U. S. national income. And if you look at the various components — that is, the value of steel

output tons and values, oil, copper, and most of the metals that go into military production — one views these figures with a certain amount of equanimity because they all show as of recent date that the U. S. position is a multiple of the Russian position in all these respects.

One thing I want to suggest to you is that reflection on these figures is apt to lead to too great a state of equanimity because there are other considerations that bear on this matter. One of the first and most important of these considerations is: What percentage of the national income of a particular country can under peacetime circumstances be devoted to military production? The countries of Western Europe, the United States, the Free World in general, show enormous variations in the percentage of national income that is in fact devoted to military production. When you look at the Russian-American comparison, the differences are rather striking.

When one talks about the percentage of national income that can be devoted to military production, one has two main things in mind. One of them has to do with the structure of production. To what extent is the structure of production, the allocation of economic resources among various industries, so ordered as to make a transition to military output extremely easy? That is the first question involved. The second question involved is: To what extent is the civilian section of the national income compressible in peacetime?

Looking at the first of these questions, regarding the relation of the structure of production in both countries to military potential, there is not perhaps a great deal to choose. Russia has become a highly industrialized country in the last twenty years. It is an extremely difficult thing to distinguish between heavy industry devoted and applicable to civilian production and industry applicable to military production. The only time the distinction becomes clear is when you get to the ultimate end products, where

a distinction can be made. But up to that point (and most of the resources involved in military production tell you up to that point) production can either go into heavy production for civilian use, either durable capital goods or durable civilian goods, or into military goods. As I say, when you look at the Russian economy you find it a highly industrialized economy, just as you find the United States a highly industrialized economy. So the applicability of civilian industries, which might otherwise produce for civilian use, to production for military use is great in both countries.

When, however, you look at the question of the compressibility of the civilian sector in peacetime you get a quite different judgement. So far as we can determine at the present time, the percentage of the Russian national income that is being devoted to investment plus military use is roughly 50%. In this country the comparable figures are around 30%. So, although the Russian national income is still a relatively small fraction of ours, the percentage of that national income that goes into investment plus direct military production is a much higher percentage —50% as against 30%.

The compressibility of civilians' requirements in peacetime is, of course, very largely a political and psychological matter. How much will a civilian population take in the way of tightening the screws? It is not entirely a political and psychological matter, though, for there are economic differences between a planned totalitarian economy such as that of Russia and a relative free enterprise economy such as ours. If the Russians want to compress the civilian sector of the economy, all they have to do is to give an order to factories to change their production from civilian to military purposes. The only result in the civilian sector is that there is a smaller quantity of goods available and the queues get a little longer. People may get restive under this, but it takes a relatively simple kind of decision at the top to switch from civilian to military production. In the American economy, particularly in peacetime, things do not work out that easily.

What you have got to rely upon mainly in a free enterprise economy are monetary incentives and penalties; that is, you have got to change your tax structure and your tax rates; you have got to change the price relationships; you have got to set up a new set of incentives or a new set of monetary penalties in order to induce a diversion of resources from civilian production into military production. In a free enterprise economy, the reaction of individuals to these penalties and incentives is by no means uniform; some people respond readily, while others do not respond very well. So even if you have the required political and psychological climate of opinion which would permit you to compress the civilian sector of the economy, in a free enterprise situation the economic factors are much more complex. As I say, they work through elaborate monetary incentives and penalties; and that, of course, along with the political and psychological factors, has a bearing on this question in which I think we are all interested: What share of the U. S. national income could in peacetime be diverted to military purposes?

I have indicated, first, that the Russian national income may be a third of ours but that that gives too optimistic an impression of Russian military potential as against the United States because there is a much greater degree of compressibility of the civilian sector of the economy. A second factor that comes into this situation, which again raises doubts as to whether comparison of national income leads to a sound approximation of the relative military potential in so far as it is based on economic considerations, is the vulnerability of the Russian economy as compared with the American economy. The vulnerabilities which I have in mind here are economic vulnerabilities, and there are two sorts. An economy may be vulnerable if it is dependent on foreign sources of supply, particularly foreign sources of output of strategic materials of various sorts. It is also vulnerable if its economy is particularly susceptible to attack (and I suppose this means air attack) on its internal installations. In respect to both those two factors it seems to be pretty clear that the American economy

as a producing unit is more vulnerable both to a cutting-off of foreign sources of supply and to internal attack on domestic installations.

Let me say a word about both of these, although I am coming back to them later. With respect to the independence of the United States on external sources of supply this, in comparison with almost any other country in the world except Russia, in a highly self-sufficient economy. In the volume of our imports in normal years, it is not more than 4%-5% of our total national income. Contrast that with England where something like 20% of their national income consists of imported materials and products. In a country like Canada, something like 25% of the national income consists of imported products. In a country like Belgium, close to half of the national income consists of imported products. Of course those products have to be paid for by exports from these countries. This country in comparison with most countries is extraordinarily self-sufficient. Nevertheless, we do import sizeable quantities of materials that are of strategic importance. I do not need to mention them for they are matters of common knowledge to all of you. We import oil, maganese, tin, nickel. We are a heavy importer of copper, lead, and zinc. We import a whole range of metals and, of course, needless to say, we are a heavy importer of uranium. So this country, although relatively invulnerable to cutting-off of external sources of supplies as compared to most of the countries in the Free World, is in a relatively different position with respect to Russia because Russia is an extraordinarily self-sufficient country. The volume of their imports is an extremely small percentage of their national income, certainly not over 1%. That is an element of vulnerability to which I will return presently.

With respect to the vulnerability of domestic installations, I would say that it is also a fact that a higher percentage concentrated in a fewer number of centers than is probably true in Russia. So, both with respect to external sources of supply and

with respect at least to the economic aspects of vulnerability, this country is in an inferior position to Russia. Again this is Point Two that one has to take into account when comparing the Russian military potential in so far as it is based on economic considerations with the United States military potential.

The third factor (and this is a very important one) leads to further qualifications. If comparisons of military potential extend over time, then relative rates of growth of the economy, relative rates of growth of the national income, have to be taken into account seriously. Looking at the United States and Russia this is, to my mind as an economist, the source of greatest pessimism in making these comparisons because in this respect growth rates in the United States and in Russian economy present a potentialy alarming picture. According to our best available estimates, there is about a 6% to 8% annual increase in the Russian national income, and that has been going on for quite a considerable period of time. The comparable figure for the United States is roughly 3% per annum. If you extend these differences in growth rates over any sizeable period of time they make an astonishing amount of difference. A cumulative growth of 3% yields a doubling of the national income about every 25 years; a 6% rate, cumulatively, yields a doubling in less than 12 years, and an 8% rate in less than nine years. So if you are not looking at the immediate situation but the situation over time, this comparison of Russian rates of growth in national income with U. S. rates of growth become a very important and, I would say, a potentially alarming situation.

If you focus your attention on this matter it now becomes an important, but probably unanswerable, question as to how long one could expect the continuation of these very rapid growth rates in the Russian economy. There are certain reasons for thinking that there may be some kind of a terminal point. But let me say that as far as I can see these are rather speculative considerations. One point, and perhaps the most important point

here, is that the very rapid rate of growth in the Russian national income may be largely explained by a once-for-all application of Western production techniques to one industry after another. After all, twenty-five years ago the Soviet economy was an agrarian economy with a very small industrial concentration. They have expanded output in industry after industry. In the main, they have had available to them the techniques of production of the most advanced Western countries, including ourselves. These techniques could be borrowed. It is possible to argue that the very rapid rate of growth of Russian national income has essentially been brought about to date by reason of the fact that in first one industry and then another they have taken Western techniques of production and then applied them to the domestic situation. To the extent that that is so, that is a once-for-all kind of operation and when these techniques have spread out over all the whole range of Russian industry the extent of their borrowing come substantially to an end. So it may be possible that these extraordinary growth rates are due to that fact to a large extent and, if so, there is a terminal point to these rapid growth rates.

Another consideration (and this is even more speculative) is whether or not in the course of time psychological and political considerations are going to make it necessary for the Russian economy to divert an increasing percentage of their national income to the satisfaction of consumer wants. As I have pointed out already, considering the relatively low level of the Russian national income, the percentage of resources diverted to investment and to military production is extraordinarily high. Of course the result of that is that consumers' standards of living in Russia are extraordinarily low; not only are they extraordinarily low but they have not risen, so far as one can see, to any considerable extent for a long period of time. The question arises as to how long a population, even in a totalitarian state, can be squeezed down in this way. A lot of people who look at this question are extremely optimistic since they see signs already of the necessity in Russia of diverting resources from military to civilian produc-

tion. I would say that a regime that has done this pretty satisfactorily for twenty years may very well be able to keep on doing it for an indefinite period of time. Nevertheless, that is a consideration and it needs to be taken into account.

A third consideration very frequently advanced is that current growth rates in Russia are really rates that accrue on a relatively small base. That is if you take the size of the national income either now or ten years ago in Russia, you are talking about a relatively small quantity and it can be argued that growth rates on that relatively small base can be more rapid than they are likely to be when the size of the Russian national income increases. That is an argument, but to my mind it is rather a nebulous argument. I am not quite clear why that necessarily must be so; I am not quite clear why if the Russian economy is able to avoid any raw materiel shortages, is able to continue the rate of technological change which seems to be pretty rapid, is able to maintain a tremendous volume of investment in relation to the national income—I am not quite able to see why that rate of growth may not continue for a fairly long period of time. So, summarizing this point (and I think this is a very serious point), I would say that if you do not limit your comparisons of Russian economic potential with U. S. economic potential to the present situation but look a little way ahead, for ten or fifteen years, then the respective growth rates become a very important element in this consideration. And it is a fact that now and over the last ten years, or twenty years ignoring the war situation, growth rates in the Russian economy have been extraordinarily high.

The other side of that picture of course is: What is likely to happen to growth rates in the United States? Here, the factual side of the matter is that this approximate 3% per annum growth of U. S. national income is a rate that is extended quite far back in the past. In general, the trend in U. S. national income for the last fifty years has shown on the average about a 3% per

annum increase in national income. If you push it back further, that rate tends to increase somewhat because the rate of growth of national income is a function of two things really: first, it is a function of the rate of growth of the labor force (and that, of course, depends on the rate of population growth) and it is a function, secondly, of the rate of increase in per capita productivity in the economy. Per capita productivity will depend in general on the amount of capital, and the extent of technical improvements in the use of capital, that are made available per unit of the labor force. If you run back into American history, you run into much higher population growth rates than we have seen over the last fifty years. So, the probability is that a hundred years ago we had a substantially higher growth rate of the national income, but it was due almost entirely to differences in population growth.

Attempting to look ahead and grapple with this question of what is likely to be the perspective growth rate of the American economy, I would say that the principal factors that need to be taken into account are: (1) the rate of population growth, because that determines the rate of growth of the labor force; (2) the question of raw materiel availability for much higher outputs in the United States; (3) the question of the rate of technological progress, and (4) the rate of savings which becomes available for investment. Obviously, attempting to look ahead with respect to these elements is looking into a crystal ball. And the picture that one is able to paint is at best a somewhat cloudy picture. Nevertheless, since this question of relative growth rates is so important, I would like to lay before you what might be known and surmised that has a bearing on this question of "probable rates of growth."

With respect to the first element — population growth determining the size of the labor force — we do, of course, have projections. The census is continually making projections of the probable size of the U. S. population "X" years hence. The median census estimate (they make three estimates: an estimate on the

high side, on the low side, and a median estimate) — the median census estimate of the U. S. population twenty-five years from now, or 1977, is 193 million. That means a growth rate of the U. S. population of just under 1% per annum. If the population grew at that rate that would mean that the U. S. labor force would increase at approximately that rate, at something like 1% per annum. Since the labor force means the numbers of pairs of hands that are available for production if there is no change in per capita productivity, that growth element in itself would mean a 1% increase in U. S. national income.

With respect to raw materiel availabilities, there has recently been undertaken a very extensive survey of the U. S. raw materials position with projections of availability of raw materials forward for the next twenty-five years. I am referring to the report of the President's Materials Policy Commission in 1953. I happened to be a member of that Commission (it was a five-man Commission) and I spent a good part of two years in working on that problem. Although I am not saying that my ideas are accurate, I am saying that they have been painstakingly acquired. My net judgement, for what it was worth, is that there is really no reason to anticipate over this period of time that we are going to run into serious difficulties on the raw materials side. I see no particular reason for believing that what economists call the "real cost per unit of output of materials" is going to increase. When you talk about the "real cost per unit of output," you are talking about the physical inputs of men and capital required per unit of materiel output. If you could foresee a sharp increase in real cost of materiel output, then that would constitute a deterrent to a continued increase in national income because it would mean we would have to put greater and greater quantities of resources per unit of materials output in order to meet our requirements. So far as I can see, that is not the picture in the United States.

If you go from one important material to another — let me take up two of the most important of them, oil and iron ore, which

are frequently considered to be materials for which we are confronted with a difficult scarcity situation — I cannot see in fact that that is likely to develop. With respect to oil, although there is some indication that the real cost of discovering oil in the United States is increasing it is not very convincing evidence. Furthermore, of course, we do not have to rely on domestic sources of natural oil supplies. In any kind of a calculation foreign sources of supply are of much lower cost than those of the United States. So there is a possibility of meeting our domestic requirements by increasing oil imports and that is what we have been doing over the last ten or fifteen years. Fifteen years ago, the United States was a net exporter of oil. Since the war, we have become a net importer of oil on quite a large scale. Our current oil consumption runs a little over 7 million barrels a day and about one million barrels a day of that is imported oil; maybe 800,000 barrels from Venezuela and maybe 200,000 barrels per day from the Near East. So there are external low-cost sources of supply. I do not need to tell you, of course, that a large increasing dependence on the Middle East for our oil sources tremendously increases the vulnerability of the United States to a cutting-off of external sources of supply. There are also alternative domestic sources. I am talking obout synthetic oil possibilities, shale, coal, which at the present time are certainly not much higher in cost than natural oil extraction and will undoubtedly fall in cost over time. So just to take that as an example, I think the same kind of a situation exists with most materials. I see no necessary reason for a shortage situation or an increase in cost of materials extraction. With respect to iron ore, which is frequently presented in an alarming way, such as: "We are running out of our existing resources of high-grade Mesabi ore," even if we had to depend on alternative domestic sources, that is, on relatively low-grade taconites, the increase in cost of pig iron involved would not be more than 10% to 15% and pig iron is a relatively small element in the cost of producing steel. So I do not think there is anything very alarming in that picture. Summarizing now (and you simply have to take my word for it, for I am just giving you an over-

all judgement), looking over the whole materials field, I see no reason to expect that we are going to have difficulties in meeting our raw materiel requirements over the next twenty-five years.

When you come to the rate of technological progress, that is obviously a tremendously important component in the rate of increase of national income. When I talk about technological progress, I also mean improvements in business and industrial organization and administration. Things of that sort, of course, are peculiarly recalcitrant to any attempt to predict. What we have seen in the past is roughly a 2% per annum increase in per capita productivity. The increase in our national income has been accounted for in the past to the extent of about 1% per annum by population growth and to the extent of about 2% per annum from increase in per capita productivity. That rate of increase in per capita productivity depends primarily on the rate of technological improvement. So far as I can see, we can say very little about that. All we can say is that, considering the numbers of trained professional personnel flowing into the critical areas that are in main responsible for technological change, there is no very overriding reason for expecting either a marked increase or a marked decrease. It is obvious, however, that such a conjecture could be radically wrong.

With respect to the problem of savings and investment, there is, in my opinion, no problem at all. The rate of savings in a high-income economy such as the United States is very high indeed. In fact the kind of economic difficulties we encounter in this country tend to be the fact that investment opportunities do not open up quite as rapidly as the rate of savings develops so that we are frequently faced with the situation in which the volume of savings is excessive and is one of the important elements in the current depressions in the United States. But that is a big subject in itself.

Looking at these main elements which determine growth rates, really I cannot see much reason for supposing that there

is going to be marked upward change nor can I see any reason why we should have to encounter a marked downward change. In sum, my hunch is (and no one can have more than a "hunch" on this matter) that while there are no insuperable obstacles to the continuation of a growth rate of 3+ per cent per annum, it would be unwise to base calculations on a higher growth rate than that. So I would say if you look at this problem of military potential over a substantial period of time that this disparity of Russian and U. S. growth rates, if it continues, raises some interesting questions for speculation in the field of military strategy. But I am not going into those questions, largely because I feel that I am much more ignorant on that kind of a subject than you are.

Now let me make a final cautioning remark before I leave this subject on the relationship between economic considerations and military potential. It ought to be recognized that this whole analysis which I am undertaking rests on a certain basic assumption. The base of that assumption is that military capability is a relatively continuous function, to use a mathematical term, of the input of economic resources. So if the input of economic resources into a military production can be increased, you will necessarily have an increase in military potential in so far as that depends on quantities and qualities of materials.

Has the advent of the A and H bombs changed that kind of calculation? I don't know. I put that to you as a question. I think it is a matter that deserves quite serious consideration. With the moving into an area of potentialities of destruction tremendously greater than anything that we have known before, it might turn out that a critically successful degree of destruction could be inflicted on the enemy with a relatively small input of resources. If that turned out to be true, then I am saying that the basic assumption on which I have been arguing to date would be altered. I have been arguing on the assumption that economic resources are scarce resources with respect to military potent-

ialities; that, in general, you increase military potential with an increase in the input of economic resources indefinitely, although perhaps not at a constant rate. Has there occurred a change in military technology of the sort that permits a critical degree of destruction on the enemy with a relatively small fraction of the input of our available economic resources? If so, this analysis of mine that depends on the assumption of scarce resources, and all economic analyses depending on the assumption that resources are scarce in relation to wants, needs or requirements, would have to be altered.

I think, though, before leaving this subject that if one looks at the defensive side of this picture rather than the offensive side, it is difficult to come to the conclusion that the analysis on which I have been depending will in fact have to be discarded. Because I think when you look at the defense requirements created by these new military weapons you probably come to the conclusion that there is on almost limitless relationship between the input of economic resources and military capabilities if you include the defensive as well as the offensive considerations here.

One final question which is an important question, but one on which I am not going to have much time to spend because I must return now to the second main question, is the question: What is the percentage of the U. S. national income that might be devoted to military production in peacetime? I think that is mainly a political and psychological question rather than an economic question. It has economic aspects of two sorts. One aspect is that unless in peacetime you are going to resort to direct control (I mean allocation of resources, price control, and everything that goes with it), you have a much more difficult problem of diverting resources away from civilian and military production than you do in a totalitarian economy. As I explained, you have got to rely on the monetary penalties and incentives involved in such things as tax rates, prices, and so on.

Then there is another economic effect that ought to be remembered. If the diversion from civilian to military production involves such a high percentage of the national income that rates of saving in the economy are markedly constricted, you may have difficulties in financing in reasonable ways that are non-inflationary the kind of output that you want. I would say, myself, that there is no reason why the volume of expenditures for military production in the United States should not be increased by at least 20 billion dollars a year without any serious economic effects. You would certainly be involved, however, in some extension of direct controls. I would say you are not likely to get that largely by reason of political and psychological considerations. I mean that the civilians in an economy like this simply put up too large a political squawk and their congressmen hear it with ears that are certainly "rabbit ears" under circumstances of this sort. But those really take me outside my own field.

Now let me turn, in the approximately fifteen minutes which remain to me, to discussion of the second main subject about which I want to talk; that is, The Relation of Economic Considerations to the Use of Military Capabilities in Wartime. Two questions need to be considered here: First, to what extent is it advisable to divert military striking power (striking power that could otherwise be used for military objectives) to the protection of our own economic base? I take it to the extent that where military resources are devoted to economic objectives there is loss of striking power and military strength. I take it that one of the problems with which you have to wrestle is how to minimize the diversion of military striking force away from military objectives.

The second main question is: To what extent are economic targets of attack to be preferred to military targets in the use of our forces against the enemy? Those seem to me to be the two essential questions that arise under this general heading of "The Relation of Economic Considerations to the Use of Military Capabilities in Wartime."

I must say that the answers to both of these questions have been changed so drastically by changes in recent military technology that the experience of the recent past may be irrelevant. I don't know. That is a matter for you to decide and is a matter about which you know more about than I do. Let me indicate, however, what my experience in this area has been and then raise the question as to whether it is any longer applicable.

When you look at this first part of the question, "to what extent is it necessary to divert military resources for the protection of an economic base," again you have got two questions involved: (1) To what extent is it necessary to divert military forces to the protection of a continuous inflow of foreign sources of supply, and (2) to what extent is it necessary to divert military resources to the protection of domestic installations?

With respect to the first question, I have already pointed out that we are relatively self-sufficient, but we do still have requirements for sizeable imports. I, myself, would say (and this is a matter that I covered in fairly great detail in an article of mine which I think has been assigned to you for reading, so I will just summarize it here) that with the use of any sensible precautions it is unneccessary to divert any large quantity of military striking power to the protection of the U. S. and the cutting-off of foreign sources of supplies. The main reason for that is that means are known, if they are used in advance, of preparing ourselves against this eventuality. Of course one obvious and very important means is the stockpiling of strategic materials. If that is done in quantities in which it should be done, then it becomes relatively important whether we are cut off from external sources of supply. But there are other means. There is creation of stand-by facilities for materials such as synthetic rubber production or aluminum production, etc. There are also possibilities of storing in the ground materials of which we have not availed ourselves to any very considerable extent. I am not going into those questions now. They are important questions, but I think they have been adequately covered elsewhere. All I am saying is that if these

devices are effectively used in advance, if economic planners (if you want to use that term) do their job right, and Congress comes through with sufficient cash, then I see no great need of diverting military striking forces to this kind of economic defense.

With respect, however, to the protection of our domestic installations, obviously we are runing into a very different picture. Here, it seems to me to be difficult any longer to make any sharp distinction between military targets and economic targets when you have weapons of such destructive capacity as the A-bomb and the H-bomb. I do not know whether destroying Pittsburg or destroying New York represents a military target or economic target, or what.

With respect to the question of how much of our striking force is necessary to divert to the protection of these targets, if you call them economic targets, that is a matter on which I have no special knowledge. All I can say is, as a civilian it looks to me as though the destructive capabilities were so great that unless we divert enough of our striking force to protect a critical minimum of these resources that there is not much use of talking about anything more. This, I think, represents a fundamental change from my experience in previous wars because that was certainly not true in World War I or World War II. So, again, in answer to this first sub-question, "is it necessary to divert military striking forces to the protection of our economic base," I would say that with respect to external sources of supply if we take adequate precautions it is not necessary to any considerable degree. With respect to the protection of our civilian economic base, I would say that you know a great deal more about that question than I do. But it looks to me as though that is a necessary diversion of military striking force.

When you look at the second aspect of this general question, "to what extent in the use of our own striking forces against the enemy are economic targets to be preferred to military targets," the same kind of general argument applies. With respect

to Russia, Russia is even more invulnerable than we are to the cutting-off of external sources of supplies. So I would say there is no point at all in talking about that kind of economic target. I have no doubt that it would become important in time of war to deny the Russians the use of Middle Eastern oil. I also have not much doubt but that can essentially be done without the use of large military forces.

Finally, and this is the concluding element about which I want to talk, here is a brief summary of how that situation (as I see it) has changed by reason of changes in military technology. While I am forced to raise the question as to whether an analysis of our experience really throws much light on the present situation, in World War I I take it that there is no doubt that Britain did achieve significant results — some would say "decisive results" —by denying to Germany access to external sources of supplies. The reasons why those results were important were two: (1) They were important because German space was extraordinarily dependent on foreign sources of supply, and (2) Germany had made no advance preparations before World War I to meet that eventuality. The result was that during about the third year of World War I Germany was being starved out. The economic situation in Germany was a serious economic situation. It had serious political repercussions in Germany. And I think there is very little doubt that economic warfare, carried on very largely of course during that period by naval blockade, had highly important results.

The situation in World War II, however, was very different. And the reason that it was very different was that the German space in World War II was by no means as heavily dependent on external sources of supply. First, Germany in World War II, by reason of its conquests, had the whole of Europe on which to depend and they could bleed civilian populations white in areas outside of Germany without worrying about it. The second reason was that Germany had made pretty adequate advance preparations in

World War II through stockpiling of materials and, in particular (and this is a matter in which I go into considerable detail in that article which I think you have read), in World War II Germany had found the capability of applying her technology to the development of substitutes in really remarkable fashion. So Germany, really, in World War II, simply designed out of scarce materials and into the materials that were more plentiful. By reason of those two facts — a larger economic space and advance preparations — I would say that the naval blockade of Germany inflicted negligible results on German military potential in World War II.

I think it is generally agreed (you would know more about this than I) that although the air attack on German economic installations produced a great effect, it did not produce what we might call a "decisive effect" in any sense of the term. As I read the record of that situation, air attack on German economic targets began to affect German military capabilities, if at all, only towards about the last six months of the war. It is, of course, true that the attack on economic targets in Germany did force a diversion of resources from destroyed factories into building other factories, and so on. But the Germans found it possible to have the civilian sector of the economy take up most of the slack. So as I read that record, air attack did not have a decisive effect by any means on German military potential. It had a pronounced effect only very late in the war. The experience of World War II, with respect to these things of which I am talking, was very different than World War I.

But can you base present analysis on the experience of World War II? As I have emphasized, certainly now there is no point in spending large military resources in denying our potential enemy access to external sources of supply. There may be a few qualifications to that remark, but they are not many.

When we get into the realm of air attack with new weapons, then what is the answer to the question about economic targets versus military targets? Here, as I say (and perhaps I am speaking

as an ignorant layman), I find that the distinction, as I have already said, between what is proper to call "economic" and "military" targets gets extremely fuzzy. Certainly I think that attacks on installations in Russia become a primary set of targets, but whether you want to call them "military targets," whether you want to call them "economic targets," or whether you want to call them "destruction of population," or "political targets," or "psychological targets," or what have you, I do not know. All I am saying is that I do have grave doubts as to whether the experience of economic warfare in World Wars I and II is very relevant to the problem with which we are confronted today.

Finally, in summary, let me say that I have been talking about the two subjects which seem to me to be essential to this question in the relevance of economic considerations to strategy. The first has to do with the relationship between economic considerations and military capabilities or military strength. After summarizing all the pro's and con's there, I find myself, despite the development of new weapons, still of the opinion that when you take the *defense* as well as the *offense* into account it is still true to say that there is a functional relationship between the input of economic resources and military capabilities. As long as that is so, then questions of the size of the national income and the rate of growth of the national income become matters of decisive importance as far as I can see for our military strategy.

The second great question is the extent to which military considerations in wartime should affect the use of military striking power. That has a defensive aspect as related to our own economic base and also offensive implications as related to the economic base of the enemy. I think the most useful thing that I have been able to do was to raise a caution in your minds as to whether even the most careful study of the experience of the recent past throws a lot of light on what the problem is which we confront.

BIOGRAPHIC SKETCH

Professor Edward Mason

Professor Mason was born in Clinton, Iowa, on 22 February 1899. He received an A. B. degree from the University of Kansas in 1919, an A. M. degree from Harvard University in 1920, a B. Litt. degree from Oxford University, England, in 1923, and a Ph. D. from Harvard University in 1925. In 1948 he was awarded a Litt. D. degree from Williams College.

Dr. Mason has been on the faculty of Harvard University since 1923, beginning as an instructor and advancing to full professorship in 1937. Since 1947 he has been Dean of the Graduate School of Public Administration.

He has served the Government in many capacities. In 1938-39, Professor Mason was economic consultant to the Department of Labor, and from 1940-41 he served on the Defense Commission. He was in the Office of Strategic Services, 1941-45, Deputy to the Assistant Secretary of State in charge of Economic Affairs, 1945, and Economic Counsel to the State Department, 1946-47. In 1947 he was Chief Economic Advisor at the Moscow Conference. Professor Mason was appointed by President Truman as a member of the Advisory Committee on Management Improvement to assist in improving Government organization and served as a member of the Materials Policy Commission in 1951. In 1946 he was awarded the Medal of Freedom.